

CIIR ACTIVITIES

1 June 2006 – 30 September 2006

(I) Activity Highlight

Introduction of Distance Learning PG Level Course “*Integrity Information System*” for M.Phil. (IT) Degree of Yeshwantrao Chavan Maharashtra Open University

CIIR Activity Report for period 1 April 2006-31 May 2006 highlighted strides made by CIIR in areas of I*I education, research and in networking with institutions and professionals for widening I*I researcher and educator community base. CIIR Activities during period 1 June 2006 – 30 September 2006 further build on these developments.

Specifically, as described in CIIR Activity Report of 31 May 2006, *Information Integrity course* was offered at Research/ M.Tech. level at IIT Bombay from July-December 2004, and at PG level under Master of Computer Applications (MCA) Degree program of S.N.D.T. Women’s University, Mumbai, from July-December, 2005. These institutions have these *I*I courses* under elective (optional) category of course offering. Prof. Vijay Mandke participated in teaching the courses. Currently, at S.N.D.T. Women’s University, Mumbai, *Information Integrity course* is being offered from June-December 2006 for the MCA degree students, and Prof. Mandke is teaching it.

CIIR Activity Report of 31 May 2006 also reported introduction of *UG level Course Subject No. 40421 “Management Information System”* under B.E. Electronics Degree program of University of Pune (UoP). The course is a compulsory course and is designed as an introduction to Information Integrity of Information Systems (IS) and Information there from. The first offering of the course will be from January-April 2007. Currently, Prof. Mandke is participating with engineering institutions from UoP in organizing teacher-training workshops for the course.

Taking these educational initiatives further, during the period under consideration, Yashwantrao Chavan Maharashtra Open University (YCMOU), Nasik introduced a research level course “*Integrity Information System*” under the University’s M.Phil. Degree in Information Technology (IT). Most significant aspect of this initiative is that while, on the one hand, the course will be offered through distance learning, thereby providing a wider platform for the course to reach different desirous learner groups, on the other hand, as a component of M.Phil. (IT) Degree, the course will specifically target teachers of engineering, science and professional institutions from Maharashtra state, with stakes in pursuing research for self-development. This offers a formal, institutional mechanism for integrating I*I knowledge development objective of CIIR with faculty development needs of institutions.

(II) Overview of Main CIIR Activities

From June 1, 2006 – September 30, 2006, CIIR pursued research & education activities of: (1) Completion of I*I Project work at CIIR Pune by Ms. Natasha Kapoor, student of Master of Computer Applications (MCA) Degree, SNDT Women’s University, Mumbai; (2) Completion of I*I Course offering under Continuing Education Program (CEP) activity at CIIR, Pune; (3) I*I Paper presentations by Prof. (Ms.) Manisha Dale, Prof. Kashinath Munde, Ms. Natasha Kapoor, Prof. Milind Mali and Prof. Vijay Mandke at The 3rd IEEE Conference ICMIT2006 held at Singapore, June 21-23, 2006; (4) I*I Paper presentation by Prof. (Mrs.) Reema Khurana and Prof. Vijay Mandke at International Conference BAI2006 organized by ATISR at Singapore, 12-14 July 2006; (5) Teaching of Information Integrity course at S.N.D.T. Women’s University, Mumbai; (6) Participation in *Teacher Training Workshops* conducted at engineering institutions of UoP for “Management Information System” course, The UG level Course is offered under B.E. Electronics Degree program of University of Pune and is an introduction to Information Integrity; (7) Participation in design and development of PG level Distance Education Course “Integrity Information System” at YCMOU University; (8) I*I Research Interactions; (9) Doctoral research in I*I; (10) Work on a comprehensive I*I Research Paper; and (11) Editing of CIIR’s Research Publications.

The CIIR activities, mentioned above, are briefly described here.

1. Completion of I*I Project work by Natasha Kapoor

Ms. Natasha Kapoor, student of Master of Computer Applications (MCA) Degree, PG Dept. Of Computer Science, SNDT Women’s University, Mumbai, attended I*I Course at SNDT Women’s University from 24 June 2005 – 12 December 2005. Following this, during her VI th and the final Semester of MCA Degree, she did her project work at CIIR.

Specifically, in partial fulfillment of her MCA degree requirement, from 1 January – 30 June 2006, Natasha worked as I*I research assistant at CIIR, Pune on her six-month I*I Technology Development Project entitled “*Customer Continuity Planning (CCP)-Information Integrity Based Approach – Towards Information Integrity Technology Development*”.

Further, during the VI th Semester, Natasha also did her Seminar course work on the topic of “Complex Errors”.

Additionally, during her work with CIIR, Natasha jointly worked on two I*I research papers for international conferences, namely, ICMIT2006 and BAI2006 (See item [3]), presented paper at the international conference ICMIT2006, participated in the “Continuing Education Program in I*I” at CIIR, Pune by delivering lectures in System Dynamics, delivered I*I seminar at IIT Bombay, participated in I*I academic seminars, workshops and discussion meetings from time to time, and redesigned and developed CIIR website.

Natasha’s all round contribution to CIIR work was outstanding. CIIR wishes her all the success in all her future endeavors.

2. Completion of I*I Course Offering under Continuing Education Program (CEP) activity at CIIR, Pune

From September 10, 2005 - August 26, 2006, under its Continuing Education Program (CEP) Activity, CIIR conducted *Information Integrity Course* at CIIR, Pune. The course, which was taught by Prof. Vijay Mandke was implemented for the faculty of the engineering colleges and other institutions at Pune. Ms. Natasha Kapoor, I*I research assistant at CIIR, Pune, assisted in course delivery. Objectives of the course offering were: (a) Faculty development for research in I*I, (b) Faculty development for I*I education, (c) Development of I*I research desk at institutes in the region, and (d) Planning for I*I Seminar at National level.

Following faculty members attended the course.

- (i) Professor (Ms.) Manisha Dale, Head, Dept. of Electronics & Telecommunications (E&T) and Asst. Prof. in E&T, Modern Education Society's College of Engg., Pune,
- (ii) Professor Milind Mali, Asst. Prof. in Mechanical Engineering Institute, Smt. Kashibai Navale College of Engineering (SKN's COE), Sinhadgad Technical Education Society (STES), Pune,
- (iii) Professor Gajanan Patil, Faculty, Dept. of Electronics, Armament Institute of Technology (AIT), Pune,
- (iv) Professor Pandurang Patil, Head, Dept. of Electronics, AISSMS's College of Engg., Pune,
- (v) Professor Vijay Thorat, Head, Dept. of Civil Engg., AISSMS's College of Engg., Pune, and
- (vi) Professor Kashinath Munde, Dept. of Mechanical Engg., Modern Education Society's College of Engineering (MES's COE), Pune,

The course lectures were scheduled weekly on Saturday and Sunday. Participant's course performance was evaluated based on Examination, Research paper presentation, Development of I*I education activities, and Lecture discussion participation.

Appendix 1 summarizing the items discussed at the course completion meeting held at CIIR, Pune on August 26, 2006 gives the list of lectures covered under the I*I course and I*I knowledge development activities as planned by the I*I research group at CIIR, Pune in the coming year.

3. **Presentation of I*I research papers at The 3rd IEEE Conference ICMIT2006 held at Singapore, June 21-23, 2006**

Following I*I papers were presented at ICMIT2006 held at Singapore in June 2006.

- a) "Information System's View of Biometric Analysis" by Manisha Dale, Kashinath Munde, R.M. Bodade, and Natasha Kapoor, and
- b) "Information Integrity Knowledge Development- A Critical Requirement" by Milind Mali, Reema Khurana, S. P. Kallurkar, and Vijay V. Mandke.

CIIR researchers Prof. Manisha Dale, Prof. Kashinath Munde, Prof. Milind Mali, Ms. Natasha Kapoor and Vijay attended ICMIT 2006. The paper *Information System's View of Biometric Analysis* was presented by Kashinath, Manisha and Natasha, while the paper *Information Integrity Knowledge Development* was presented by Vijay and Milind.

The papers are published in the conference proceedings.

4. Presentation of I*I research paper at the International Conference BAI2006 organized by ATISR at Singapore, 12-14 July 2006

Following I*I paper was presented at BAI2006 held in Singapore in July 2006.

- a) “Achieving comparative economic advantage through Information Integrity” by Reema Khurana, Natasha Kapoor and Vijay Mandke.

Prof. (Mrs.) Reema Khurana, Associate Professor of Computer Science, Institute of Management Technology, Ghaziabad (UP), India and Vijay attended the conference and presented the paper.

Further, Prof. (Mrs.) Reema Khurana also chaired the paper presentation session “*Strategy, Entrepreneurship and International Business*” in which the paper was presented. CIIR congratulates Prof. Reema Khurana for this honor.

The paper *Achieving comparative economic advantage through Information Integrity* appears in the conference proceedings.

5. Teaching of Information Integrity course at S.N.D.T. Women’s University, Mumbai

Currently, in the 1st Semester of the Academic Year 2006-07, the Post Graduate (PG) Department of Computer Science, S.N.D.T. Women’s University, Juhu Campus, Mumbai is offering “*Information Integrity*” course as an elective course category under the University’s Master of Computer Applications (MCA) degree program.

This is the second offering of *Information Integrity* course at S.N.D.T. Women’s University, Mumbai (the first offering was in 1st Semester of the Academic Year 2005-06). The course teaching is being implemented from June-December 2006.

Like in the academic year 2005-06, Prof. Vijay V. Mandke is invited by the University to teach Information Integrity course. Seven students have registered for the course. The course has 3 lectures a week, which are delivered on Thursday and Friday.

6. Participation in Teacher Training Workshops conducted at engineering institutions of UoP for “Management Information System” course; The UG level Course is offered under B.E. Electronics Degree program of University of Pune and is an introduction to Information Integrity of Information Systems (IS) and Information there from

CIIR Activity Report of 31st May 2006 has reported that, from the Academic year 2006-07, University of Pune (UoP) under its B.E. (Electronics) Degree program has introduced, at the 4th and final year level, a UG Course *Subject No. 404210 Management Information System (MIS)*. The course is designed as an introduction to Information Integrity of Information Systems (IS)

and Information therefrom. It is a semester long 100 marks core paper with weekly 4 hrs. lecture teaching. CIIR Activity Report of 31st May 2006 has given the course content in brief. Appendix 2 gives the detailed course syllabus.

Under University of Pune, 10 engineering colleges offer B.E. Electronics Degree. These colleges are spread across the Indian Western State of Maharashtra. Colleges are located at various cities/towns, namely, Pune, Alandi, Pimpri, Hadapsar, Ahamadnagar, Copergaon, Pravaranagar, Nashik, Sangamner, etc. The first offering of *the course Subject No. 404210 MIS* will be from January-May 2007.

It is to facilitate the “MIS” course offerings at above UoP engineering institutions that, during the period under consideration, two Teacher Training Workshops were conducted in Pune. The first w/s, held on Saturday 22 July, 2006, was organized by the Electronics Department of the AISSMS’s College of Engineering, Pune. Prof. Mundada, Member, Board of Studies for Electronics Discipline, UoP, inaugurated the w/s. Prof. Pandurang Patil, Head, Dept. of Electronics, AISSMS’s College of Engineering steered the w/s proceedings. Prof. Vijay Mandke, CIIR conducted the w/s in expert capacity.

The second Day-long w/s was held at MAE’s College of Engineering (MAECOE) at Alandi on 19th August 2006. Prof. Mahesh Goudar, Head, Dept. of Electronics and Prof. Rajan, Faculty, Dept. of Electronics, MAECOE steered the w/s proceedings, which was conducted by Prof. Mandke, CIIR and Ms. Natasha Kapoor in expert capacities.

7. Participation in design and implementation of PG level Distance Education Course

School of Computer Science of Yashawantrao Chavan Maharashtra Open University (YCMOU), Nasik, Maharashtra has introduced a PG level course “*Integrity Information System*” under the University’s M. Phil. Degree program in “Information Technology”. The M.Phil. Degree program targets faculty of science & technology institutions from the State of Maharashtra. Further, it also forms a degree leading to doctoral pursuit in computer science.

The course “*Integrity Information System*” is designed as 4 Credit course with 4 open learning blocks having total 16 units. The first offering of the course is planned in the current academic year 2006-07. The first counseling sessions’ cycle is scheduled for the month of November 2006.

Appendix 3 gives the syllabus of the course.

8. I*I Research Interactions

CIIR undertakes intense networking to further strengthen the Center’s activities and widen I*I research & education community by seeking increased involvement of academia, scientists, professionals and institutions. Within this framework, during the period under consideration, Prof. Vijay Mandke participated in following I*I research & education interactions:

- a) Expert participation in the meeting of School of Computer Science, YCMOU, Nasik and Department of Computer Science, Nowrosjee Wadia College, Pune, at Pune on August 1, 2006,

- b) Expert participation in the meeting of the School of Computer Science, YCMOU, Nasik to design curriculum for M.Phil degree program, at Nasik on August 16, 2006,
- c) Expert participation in the Admissions Committee Meeting of the School of Computer Science, YCMOU, Nasik for M.Phil. Degree program for the academic year 2006-07, at Nasik on August 22, 2006,
- d) Invited talk on I*I and meetings with Dr. S. P. Kollurkar, Principal and with the faculty at Marathwada Mitramandal's College of Engineering, Pune in July/August 2006, and
- e) Meetings with Mr. Vivek Sawant, MD, Maharashtra Knowledge Development Corporation Ltd. (MCKL), Pune and with officials of MKCL, Pune in August/September, 2006.

9. Doctoral research in I*I

(a) **Guiding Ph. D. research:** From 2003, Jointly with Dr. Ramesh, Prof. Mandke is actively engaged in guiding Ms. Reema Khurana, IMT, Ghaziabad in her doctoral work progress at S.N.D.T. Women's University, Mumbai.

(b) **Offering Expert's support:** From August 2005, Prof. Mandke is engaged in providing knowledge support for Mr. Milind Mali in his doctoral work progress at University of Pune, Pune.

Note: These are continuing activities.

10. Work on a comprehensive I*I Research Paper

Currently Vijay is working on a comprehensive research paper entitled "Systems Engineering of Information Integrity".

11. Editing of CIIR's Research Publications

CIIR is also working on editing its research publications.

Note: This is a continuing activity.

Encl: Appendices 1,2,3

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APPENDIX 1

CENTER FOR INFORMATION INTEGRITY RESEARCH

Flat A-2, Nikash Skies, Someshwarwadi, Pashan Pune-411008

Continuing Education Program Desk

Course: INFORMATION INTEGRITY

Duration: September 10, 2005 – August 26, 2006

Course Completion Meeting on August 26, 2006

A. Lectures covered in the course:

LECTURE # 1: Introduction to Course Objective

LECTURE # 2: Introduction to Course Contents and Lecture Outline

LECTURE # 3: I*I Knowledge Space – A Preview

LECTURE # 4: Growing importance of information

LECTURE # 5: Information: Its Deceptive, Ambiguous, Exciting Nature

LECTURE # 6: Degree of Complexity that Business Organizations can sustain and control

LECTURE # 7: INFORMATION INTEGRITY – CONCEPT AND DEFINITION

LECTURE # 8: Need for Information Economics Framework Information *economics* versus *Information economics*

LECTURE # 9: Information As A Product

LECTURE # 10: Existing Integrity Concepts and Mechanisms and their Main Limitations- Bird's eye view

LECTURE # 11: Existing Perceptions of Certainty, Risk, Uncertainty, and Risk Aversion

LECTURE # 12: Existing perceptions of Information value

LECTURE # 13: Time for a short break from main stream lectures by the way of developing field level insight into I*I Application to problem solving -

A Real life example: Hypotension treatment case modeled as Information Origination Integrity Control problem for Healthcare Goal Delivery

LECTURE # 14: Modeling Error– Information Error

LECTURE # 15: Open System view of Business Enterprise System: Informational and physical work systems

LECTURE # 16: Generic Business Process as integral to a Close Loop Information and Control System

LECTURE # 17: Uncertainty in Traditional Business Process, which is characterized by A Collective Decision-Making

LECTURE # 18: Uncertainty in Open System View of Business IS – A multistage decision process, which is a continuous individual information origination in the presence of uncertainty

LECTURE # 19: Business process IS view comprising a multistage decision process and as a continuous individual information origination and processing situation in the presence of uncertainty – An Elaboration

LECTURE # 20: Open System view of Business IS – A Continuous Individual Information Originating & Processing Situation characterized by uncertainty resulting in information errors and leading to loss of Information Integrity at various levels in IS and in Information there from
LECTURE # 21: Information Envelope and Uncertainties therein
LECTURE # 22: Elements of information origination process and causes of uncertainties therein
LECTURE # 23: Information Integrity Risk
LECTURE # 24: Criticality of I*I for effective and economic processing of information for competitive advantage
LECTURE # 28: Introduction to System Dynamics Modeling and Computation through DYNAMO

B. Following lectures covered through discussion of I*I research papers

LECTURE # 25: Usefulness-Usability-Integrity (UUI) Paradigm
LECTURE # 26: I*I attributes – Accuracy, Consistency, Reliability (Quantifying I*I and it's attributes)
LECTURE # 27: Cost Benefit Analysis of I*I - Descriptive Statement of Mathematical Equations for information value and for improvement of I*I

C. Following lectures covered as reading assignments

LECTURE # 29: TRADITIONAL *IS*, QUALITY *IS* AND INTEGRITY *IS* - A COMPARATIVE STATEMENT (A Research & Education Development Direction)

(Note: Up till here equivalent of 38 lectures covered.)

LECTURE # 39: SYSTEMS ENGINEERING OF INFORMATION INTEGRITY
I*I Process Level 1
LECTURE #40: SYSTEMS ENGINEERING OF INFORMATION INTEGRITY
I*I Process – Emerging insights
LECTURE # 41 SYSTEMS ENGINEERING OF INFORMATION INTEGRITY
I*I Process Level 2
LECTURE # 42: SYSTEMS ENGINEERING OF INFORMATION INTEGRITY
I*I Process Level 3
LECTURE # 43: SYSTEMS ENGINEERING OF INFORMATION INTEGRITY
(Search for Information Integrity Processes) I*I Process Level 4
LECTURE # 44: SYSTEMS ENGINEERING OF INFORMATION INTEGRITY
(Search for Information Integrity Processes) SYSTEMS REPRESENTATION OF I*I PROCESSES
LECTURE # 45: LOOKING AHEAD.... (Search for Information Integrity Technology)

D. Participant's course performance evaluated based on:

- a. Examination,
- b. Research paper presentation,
- c. Development of I*I education activities, and
- d. Lecture discussion participation.

E. Planning ahead:

- a. Organizing BE Electronics MIS course teacher workshops,
- b. Planning to make extensive use of ITC for strengthening CIIR activities,
- c. Acquiring mastery of System Dynamics application software,
- d. Preparation of I*I course material for course MIS and for YCMOU course,
- e. Preparation of I*I research proposals by individual participants,
- f. Establishing I*I research and education study centers at institutions,
- g. Planning for Seminar.

Appendix 2

404210: Management Information Systems

Teaching Scheme

Lectures: 4 Hrs/week

Examination Scheme

Paper: 100 Marks

Unit I

Introduction to Management Information Systems for Large and Complex Engineering Enterprise

Overview of Management Information Systems, Survey of Information Systems Technologies, Development, implementation and management of IS resources, Rise of Convergence Technology, e.g., IT infrastructure, Network, Enterprise, Applications, Wireless Networks, Mobile Devices, Mobile Users; Future developments in MIS and its organizational and social implications-Complexity Advantage, (Complexity of an enterprise is ultimately limited by the amount of information that it can economically process and transfer, i.e., by the (costly) bandwidth of its internal communication channels and it is strategically critical for increased market share).

Unit II

Conceptual Foundations - Designing systems for complex and changing markets

Shift from Collective to Individual Design Decision: IS view of an engineering system; Shift from information *economics* to *information economics*; Implications of uncertainty in IS view - System failure from Complex Errors; Need for Information Evaluation - Introduction to Information Integrity, Information Integrity Risk; Systems approach to error reduction- Basis for I*I Technology Design

Unit III

Introduction to System Dynamics Modeling and Computer Simulation Language Tool for I*I Technology Development – I

System Dynamics Approach for Large, Complex Real World Problems, Problem Identification and its System Conceptualization, Introduction to the Computer Simulation Language.

Unit IV

Introduction 'to System Dynamics Modeling and Computer Simulation Language Tool for I*I Technology Development – II

Model Formulation, Model Testing and Further Development, Policy Analysis and Recommendation.

Unit V

Information Integrity Technology Development –I

Information Envelop comprising dynamic decision stages and its I*I Implications, Significance of Efficient & Economic Processing of information: On Criticality of Information Integrity for Competitive Market Advantage, Existing I*I Mechanisms and their main limitations, Usefulness-Usability-Integrity Paradigm.

Unit VI

Information Integrity Technology Development –II

Information Integrity Attributes, Cost Benefit Analysis, of I*I, Equation for I*I value, I*I Technology- a Systems View.

APPENDIX 3

MPHIL COURSE: Integrity Information System

4 Credit course

4 Blocks, 16 Units

Block I

The Complexity Advantage – Need for environmental view of information system design for large and complex enterprise

- Growing importance of information, Significance of efficient and economic processing of information for Competitive Advantage, Definition of Information Integrity.
- Overview of existing approaches to information system (IS) design – technical, behavioral, quality, Survey of information systems technologies, Development, implementation and management of IS resources.
- Rise of convergence technology, e.g., IT infrastructure, Network, Enterprise, Applications, Wireless Networks, Mobile Devices, Mobile Users, Emergence of Enterprise Mobility Value Chain.
- Implications of convergence technology for information system design, Requirement to go beyond quality information system, Introduction to integrity information system – Future developments in IS and their organizational and social implications, Complexity of an enterprise, its relationship with the amount of information that it can economically process and transfer and its strategic criticality for increased market share.

Block II

Conceptual Foundations of Information Integrity - Designing information systems for complex and changing environment

- Shift from physical work system to informational and physical work system, Shift from Collective to Individual Design Decision: Socio-technical IS view of an engineering system.
- Shift from information *economics* (economics of constraints) to *information economics* (economics of opportunities), Uncertainty in IS view and its error implications – Shift from simple to complex errors.
- Shift from information retrieving to information origination and evaluation - Economic framework for introduction to Information Integrity,
- Informational risk - Shift from concept of ex-post risk to that of ex-ante risk, information integrity risk, information correctness risk, information exactness risk, Systems approach to error reduction - Basis for I*I Technology Design.

Block III

Introduction to System Dynamics Modeling and Computer Simulation Language - Tool for

I*I Technology Development

- System Dynamics Approach for Large, Complex Real World Problems.
- Problem Identification and its System Conceptualization.
- Introduction to the Computer Simulation Language, Model Formulation.
- Model Testing and Further Development, Policy Analysis and Recommendation.

Block IV

A Design Basis for Information Integrity Technology Development

- Information Envelop comprising dynamic decision stages and its I*I Implications,

- Existing I*I Mechanisms and their main limitations,
 - Usefulness-Usability-Integrity Paradigm, Information Integrity Attributes,
 - Modeling integrity information system - Cost Benefit Analysis of Information Integrity, Equation for value of information, Equation for improvement in value of information integrity,
 - Information Integrity Technology – A System’s View.
- A. Text Book: Learners will be given individual lecture notes in the form of the power point slides. The lecture material provided will be complete and comprehensive. In time, the blocks will prepared in the self-learning format.
- B. Learners may refer to reference books. Referring to these reference books will be absolutely optional, as the lecture notes provided in power point slides, along with the counseling sessions, will take care of all learning needs.
- C. Block II visualizes use of System Dynamics Modeling software, which is freely available from the Net.

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